



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/022,362	12/20/2001	Minoru Teshima	Q67642	3575

7590

09/03/2004

SUGHRUE, MION, MION, ZINN, MACPEAK & SEAS, PLLC  
2100 Pennsylvania Avenue, N.W.  
Washington, DC 20037

EXAMINER
----------

DOVE, TRACY MAE

ART UNIT	PAPER NUMBER
----------	--------------

1745

DATE MAILED: 09/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/022,362	TESHIMA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Tracy Dove	1745	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 June 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some    \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

This Office Action is in response to the communication filed on 6/29/04. Applicant's arguments have been considered, but are not persuasive. Claims 1-9 are pending and remain rejected in view of the prior art. This Action is made FINAL.

#### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al., JP 11-354152 in view of Perton et al., US 5,472,809.

A machine translation of the Japanese document was obtained from the Japanese Patent Office web site and is attached.

Suzuki teaches a non-aqueous secondary battery containing a negative electrode, a positive electrode, a separator and an electrolyte comprising an organic solvent and a solute (abstract). The negative electrode material may be a carbonaceous material such as graphite (0020). The organic solvent contains at least one compound having the structure shown by the formula ( I ), such as phenylethylene carbonate (R=hydrogen) (abstract). The compound of formula (I) is contained in an amount of 0.05-40 wt%, preferably 0.1-20 wt% of the organic solvent (0017). The organic solvent may further contain ethylene carbonate, propylene carbonate, butylene carbonate, dimethyl carbonate (chain carbonate), diethyl carbonate (chain carbonate), ethyl methyl carbonate (chain carbonate), a cyclic ester, a chain ester, a chain ether, a

Art Unit: 1745

cyclic ether or mixtures thereof. Two or more kinds of these solvents may be mixed together (0016). Suzuki teaches a solvent mixture comprising phenylethylene carbonate, ethylene carbonate and diethyl carbonate (chain carbonate). The phenylethylene carbonate is added to a 50:50 vol% mixture of ethylene carbonate and diethyl carbonate (0024).

Suzuki does not explicitly teach the volume percent ranges of ethylene carbonate and propylene carbonate of the instant claims.

However, Perton teaches a non-aqueous secondary battery comprising an electrolyte solvent mixture made up of:

5% to 40% by volume of propylene carbonate;

10% to 20% by volume of ethylene carbonate; and

50% to 85% by volume of dimethyl carbonate (chain carbonate).

See abstract. A preferred mixture comprises 20 vol% propylene carbonate, 20 vol% ethylene carbonate and 60 vol% dimethyl carbonate. Another preferred mixture comprises 15 vol% propylene carbonate, 15 vol% ethylene carbonate and 70 vol% dimethyl carbonate (col. 2, lines 4-18).

Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one of skill would have been motivated to use the solvent mixture of Perton for the organic solvent containing phenylethylene carbonate of Suzuki because Suzuki discloses a phenylethylene carbonate is added to a solvent mixture wherein the solvent mixture may contain ethylene carbonate, propylene carbonate and a chain carbonate. One of skill would be motivated to use the solvent mixture of Perton in Suzuki to improve performance at low temperature, to improve cycling efficiency and to improve the

stability of the electrolyte (see Perton col. 1, lines 43-56). One of skill would be motivated to combine the teachings of Suzuki and Perton because both references are directed toward non-aqueous secondary batteries comprising an electrolyte including a mixture of organic solvents.

### ***Response to Arguments***

Applicant's arguments filed 6/29/04 have been fully considered but they are not persuasive.

Applicant argues the content of phenylethylene carbonate in claim 1 of the present application is "from 0.1 to 5.0 wt%", which is narrower than the preferred range of Suzuki et al. of 0.1-20 wt%. Thus, Applicant concludes the claimed range for phenylethylene carbonate is not disclosed in Suzuki with sufficient specificity to constitute anticipation. However, Suzuki does teach the claimed range for phenylethylene carbonate with sufficient specificity. Note that Suzuki teaches the organic solvent contains at least one compound having the structure shown by the formula ( I ), such as phenylethylene carbonate (R=hydrogen) (abstract). The compound of formula (I) is contained in an amount of 0.05-40 wt%, preferably 0.1-20 wt% of the organic solvent (0017). Examiner points out that the claimed range is encompassed by the preferred prior art range. Furthermore, both the claimed range and the prior art range have a common end point (0.1%). Thus, Suzuki teaches the claimed range with sufficient specificity.

Applicant asserts that the present application clearly shows evidence of unexpected results within the claimed narrow range in Tables 1-4. Applicant points out Example No. 27 (5 wt% of phenylethylene carbonate) versus Comparative Example No. 13 (10 wt% of phenylethylene carbonate). Applicant asserts the claimed range provides superior discharge capacity and cycle retention over the prior art range of Suzuki. However, Tables 1-4 do not

provide evidence of unexpected results over the prior art. Unexpected results must distinguish the claimed invention over the prior art. Comparative Example No. 13 is not representative of the Suzuki reference. Suzuki teaches a solvent mixture comprising phenylethylene carbonate, ethylene carbonate and diethyl carbonate (chain carbonate). The phenylethylene carbonate is added to a 50:50 vol% mixture of ethylene carbonate and diethyl carbonate (0024). Thus, at least this embodiment of Suzuki does not require propylene carbonate (PC), methyl ethyl carbonate (MEC) or dimethyl carbonate (DMC) that are required by Comparative Example No. 13. Examiner points out that Suzuki does not teach only 10 wt% of phenylethylene carbonate, but teaches the amount of phenylethylene carbonate is *preferably* 0.1-20 wt%. Furthermore, Table 2 teaches each of Comparative Examples 1-12 have a phenylethylene carbonate amount of 2.5 wt% (within claimed range), but result is different discharge capacity and cycle retention properties. Thus, unexpected results have not been shown to distinguish the claimed phenylethylene carbonate amount over the prior art range.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

September 6, 2004

  
Patrick Ryan  
Supervisory Patent Examiner  
Technology Center 1700